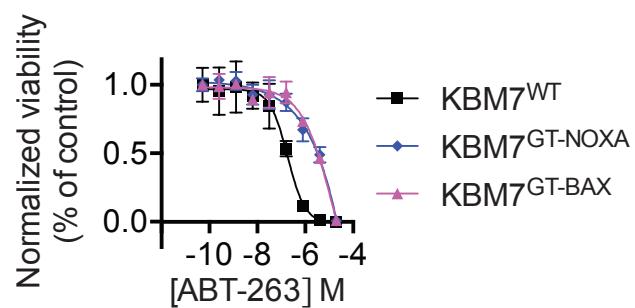


Human haploid cell genetics reveals roles for lipid metabolism genes in non-apoptotic cell death

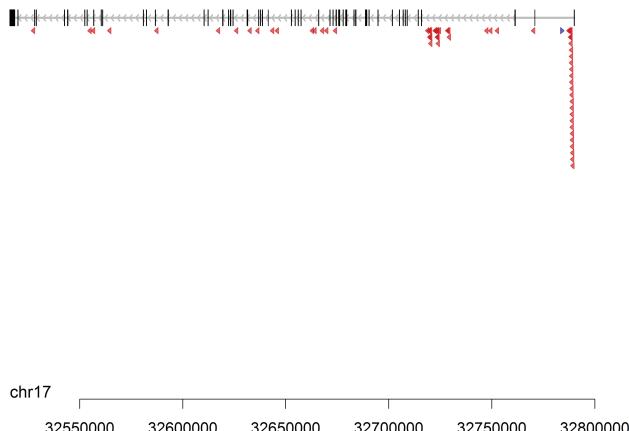
Scott J. Dixon, Georg E Winter, Leila S. Musavi, Eric Lee, Berend Snijder, Manuele Rebsamen, Giulio Superti-Furga, Brent R. Stockwell



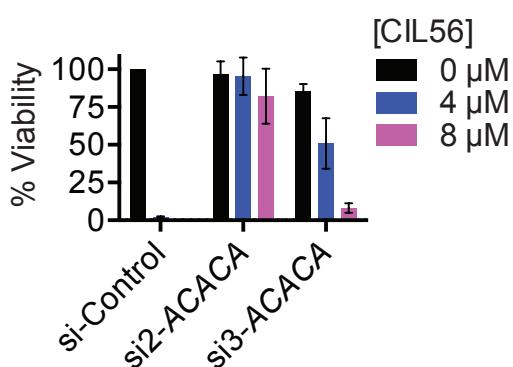
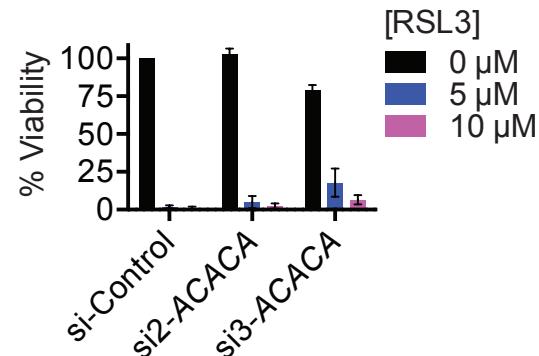
Supplemental Figure 1. Dose-response analysis of ABT-263-treated KBM7 cells. Normalized viability of wildtype KBM7 cells (WT), as well as one clonal line of KBM7 cells with a gene trap insertion into the gene *NOXA* (GT-NOXA) and one clonal line with a gene trap insertion into the gene *BAX* (GT-BAX). Data represents mean+/-SD of three independent experiments.

a

ACACA (NM_198836)

**b**

	Wild-type	Clones H and P
DNA Sequence	GTTCTTATTGCTAACAAATGGCATTGCAGCA GTGAAATGCATGCGGTCTATCCGTAGGTG GTCTTATGAAATTTGAAATGAACGTGC AATTAGATTGTTGTATGGTCACACCTGA AGACCTTAAAGCCAATGCAG	GTTCTTATTGCTAACAAATGGCATTGCAGCA GTGAAATGCATGCGGTCTATCCGT T AGG TGGTCTTATGAAATTTGAAATGAACGT GCAATTAGATTGTTGTATGGTCACACCT GAAGACCTTAAAGCCAATGCAG
Amino Acid Sequence	VLIANGIAAVKCMRSIRRW YEMFRNERAIRFVVMVTPEDL KANA	VLIANGIAAVKCMRSIR Stop VVL Stop NVSK Stop TCN Stop I R CH GHT Stop RP Stop S Q C

c**d****e**

Supplemental Figure 2. The role of ACACA (ACC1) in CIL56-induced death. (a) Depiction of the genomic loci and sites of gene trap insertion identified in KBM7 clones treated with CIL56. Red arrows indicate insertion of the gene trap in the sense orientation, and blue insertion in the antisense orientation. (b) CRISPR/Cas9-targeting of exon 4 of ACACA in HT-1080 cells DNA sequence of two independent clones (H and P) (c) Western blot analysis of ACC1 protein in siRNA-treated HT-1080 cells. (d,e). Effect of CIL56 (d) and RSL3 (e) on HT-1080 cells treated with siRNAs targeting ACACA. Results represent mean+/-SD from three independent biological replicates.

Supplemental Table 1. Analysis of metabolite levels in HT-1080 cells treated with CIL56 +/- TOFA versus the vehicle (Veh) control, DMSO.

Super Pathway	Sub Pathway	Biochemical Name	KEGG	HMDB	Metabolite level fold-change values								
					CIL-56 / Veh		TOFA / Veh		CIL-56+TOFA / Veh		CIL-56 / Veh		
					p-value	q-value	p-value	q-value	p-value	q-value	p-value	q-value	
Amino Acid	Glycine, Serine and Threonine Metabolism	glycine	C00037	HMDB00123	0.32	1.13	1.46	0.0199	0.0077	0.2686	0.9016	0.0143	0.0791
		sarcosine (N-Methylglycine)	C00213	HMDB00271	0.62	1.25	1.13	0.1600	0.0383	0.2559	0.9016	0.4193	0.3323
		serine	C00065	HMDB00187	0.54	1.15	1.54	0.0462	0.0145	0.2674	0.9016	0.0085	0.0695
		N-acetylserine		HMDB00931	0.46	1.08	1.48	0.0648	0.0193	0.7029	0.9334	0.0546	0.1285
		threonine	C00188	HMDB00167	0.83	1.04	1.30	0.3044	0.0654	0.7767	0.9334	0.1055	0.1642
	Alanine and Aspartate Metabolism	N-acetylthreonine	C01118		0.51	1.13	1.39	0.1137	0.0292	0.5593	0.9866	0.2177	0.2294
		alanine	C00041	HMDB00161	0.99	1.15	1.38	0.7172	0.1312	0.2195	0.8698	0.0288	0.1046
		N-acetylalanine	C02847	HMDB00768	0.48	1.00	1.30	0.0070	0.0038	0.9506	0.9334	0.1194	0.1714
		aspartate	C00049	HMDB00191	0.39	0.90	0.89	0.0518	0.0160	0.6958	0.9334	0.6785	0.4302
		asparagine	C00152	HMDB00168	0.26	1.05	1.45	0.0073	0.0038	0.7609	0.9334	0.0320	0.1068
	Glutamate Metabolism	N-acetylaspartate (NAA)	C01042	HMDB00812	0.40	1.14	1.21	0.0021	0.0018	0.3921	0.9698	0.2703	0.2675
		glutamate	C00025	HMDB00148	0.48	1.00	1.05	0.0065	0.0042	0.9303	0.9334	0.6655	0.4276
		glutamine	C00084	HMDB00641	0.12	1.17	1.90	0.0205	0.0078	0.4464	0.9698	0.0013	0.0365
		N-acetyl-aspartyl-glutamate (NAAG)	C12270	HMDB01067	0.48	1.00	1.04	0.0078	0.0040	0.9592	0.9334	0.6528	0.4271
		gamma-aminobutyrate (GABA)	C00334	HMDB00112	0.64	1.33	1.31	0.1669	0.0395	0.4224	0.9698	0.6095	0.4134
		glutamate, gamma-methyl ester			0.65	0.76	0.78	0.1046	0.0281	0.2730	0.9017	0.3400	0.3028
		pyroglutamate*			1.00	1.00	1.00						
		histidine	C00135	HMDB00177	0.82	1.15	1.33	0.3996	0.0796	0.3663	0.9698	0.1069	0.1642
		imidazole propionate		HMDB02271	0.56	1.23	1.35	0.0826	0.0237	0.4923	0.9765	0.1639	0.1964
		lysine	C00047	HMDB00182	1.26	1.13	1.24	0.3213	0.0679	0.1849	0.8698	0.0424	0.1141
	Lysine Metabolism	N6-acetylslysine	C02727	HMDB00206	3.91	1.07	1.32	0.0414	0.0132	0.4951	0.9765	0.0633	0.1336
		2-aminoadipate	C00956	HMDB00510	0.21	0.94	1.12	0.0173	0.0070	0.5069	0.9794	0.1589	0.1956
		5-aminolevulinate	C00431	HMDB03356	0.59	0.79	0.93	0.1361	0.0338	0.5265	0.9866	0.9236	0.5002
		phenylalanine	C00079	HMDB00159	0.88	1.12	1.31	0.3453	0.0718	0.2590	0.9016	0.0291	0.1049
		phenylacetylglycine	C05588	HMDB00921	0.48	1.11	1.66	0.0047	0.0031	0.5177	0.9866	0.0195	0.0900
	Phenylalanine and Tyrosine Metabolism	tyrosine	C00082	HMDB00158	0.97	1.10	1.35	0.8165	0.1481	0.2965	0.9210	0.0249	0.1021
		3-(hydroxymethyl)fatty acid	C03672	HMDB00756	0.67	1.13	2.25	0.1139	0.0299	0.1765	0.8600	0.0042	0.0663
		tryptophan	C00078	HMDB00929	0.81	1.10	1.34	0.0657	0.0194	0.1649	0.8513	0.0061	0.0695
		kynurenone	C00328	HMDB00684	0.38	1.00	1.30	0.1360	0.0337	0.8934	0.9334	0.3112	0.2893
		leucine	C00123	HMDB00687	1.03	1.13	1.43	0.8590	0.1510	0.2084	0.8698	0.0170	0.0836
	Leucine, Isoleucine and Valine Metabolism	isovaleryl carnitine		HMDB00688	2.14	2.21	1.00	0.3910	0.0786	0.2242	0.8721		
		beta-hydroxyisovaleryl carnitine			0.32	0.45	0.32	0.1863	0.0433	0.3571	0.9698	0.1833	0.2101
		isoleucine	C00407	HMDB00172	0.75	1.07	1.37	0.0211	0.0080	0.3970	0.9698	0.0131	0.0791
		2-methylbutyryl carnitine (C5)		HMDB00378	0.49	0.84	0.68	0.3107	0.0659	0.9522	0.9334	0.6638	0.4276
		valine	C00183	HMDB00983	0.92	1.09	1.31	0.5439	0.1041	0.4165	0.9698	0.0438	0.1141
	Methionine, Cysteine, SAM and Taurine Metabolism	isobutyryl carnitine		HMDB00736	1.43	0.73	1.08	0.9951	0.1719	0.5567	0.9866	0.8175	0.4695
		methionine	C00073	HMDB00696	1.65	1.16	1.50	0.0567	0.0174	0.2205	0.8698	0.0146	0.0791
		N-acetylmethionine	C02712	HMDB11745	2.45	1.15	1.54	0.0103	0.0048	0.2895	0.9137	0.0015	0.0365
		N-formylmethionine	C03145	HMDB01015	0.85	1.09	1.57	0.0827	0.0237	0.2579	0.9016	0.0116	0.0745
		Sadenosylhomocysteine (SAH)	C00021	HMDB00939	1.17	1.02	1.14	0.1805	0.0421	0.8166	0.9334	0.0440	0.1141
	Urea cycle: Arginine and Proline Metabolism	cystathione	C02291	HMDB00099	0.36	1.00	1.27	0.0043	0.0029	0.8698	0.9334	0.1975	0.2179
		2-aminobutyrate	C02261	HMDB00650	0.18	1.17	1.36	0.0066	0.0036	0.1679	0.8516	0.0068	0.0695
		cysteine	C00097	HMDB00574	1.18	1.10	2.27	0.9269	0.1618	0.8725	0.9334	0.1521	0.1902
		hypotaurine	C00519	HMDB00965	0.18	1.03	0.97	0.0262	0.0093	0.9341	0.9334	0.9061	0.4943
		taurine	C00245	HMDB00251	0.40	1.18	1.52	0.0945	0.0261	0.5518	0.9866	0.1012	0.1642
	Creatine Metabolism	arginine	C00062	HMDB00517	1.20	1.01	1.04	0.8523	0.1504	0.9244	0.9334	0.7881	0.4570
		ornithine	C00077	HMDB03374	1.34	1.07	1.31	0.2713	0.0599	0.8363	0.9334	0.2479	0.2519
		proline	C00148	HMDB00162	0.56	1.05	1.22	0.0383	0.0125	0.7114	0.9334	0.2487	0.2516
		citrulline	C00327	HMDB00904	1.35	1.06	1.23	0.5583	0.1057	0.5946	0.9334	0.2614	0.2612
		trans-4-hydroxyproline	C01157	HMDB00725	0.52	1.08	1.24	0.0583	0.0178	0.4936	0.9765	0.1416	0.1856
	Polyamine Metabolism	creatine	C0300	HMDB00064	0.37	1.05	1.07	0.0014	0.0013	0.7552	0.9334	0.5475	0.3960
		creatine phosphate	C02305	HMDB01511	0.49	1.07	1.00	0.0220	0.0082	0.7500	0.9334	0.9044	0.4943
		putrescine	C00134	HMDB01414	0.20	1.35	1.59	0.0374	0.0124	0.0362	0.3549	0.0045	0.0663
		spermine	C00750	HMDB01256	1.00	1.00	1.00						
		spermidine	C00315	HMDB01257	3.56	1.35	1.20	0.3782	0.0769	0.1787	0.8600	0.3995	0.3295
	Glutathione Metabolism	5-methylthioadenosine (MTA)	C00170	HMDB01173	0.69	1.10	1.03	0.0242	0.0088	0.2983	0.9210	0.6997	0.4324
		N-acetylputrescine	C02714	HMDB02064	1.25	0.96	1.07	0.9114	0.1597	0.8780	0.9334	0.7798	0.4561
		4-quaternodibutanoate	C01035	HMDB03484	1.00	1.00	1.00						
		glutathione, reduced (GSH)		HMDB00125	0.47	1.03	0.96	0.0018	0.0015	0.7817	0.9334	0.8529	0.4813
		glutathione, oxidized (GSSG)	C00127	HMDB03337	0.77	1.40	1.22	0.2001	0.0456	0.0086	0.2216	0.1614	0.1962
	Peptide	gamma-glutamyliso-leucine*		HMDB01170	0.58	1.00	1.10	0.0169	0.0069	0.9401	0.9334	0.4775	0.3640
		gamma-glutamylleucine		HMDB01171	0.56	1.15	1.24	0.0665	0.0195	0.5420	0.9866	0.3033	0.2858
		gamma-glutamylphenylalanine		HMDB00594	1.02	1.13	1.24	0.8173	0.1461	0.9580	0.9334	0.5028	0.3782
		gamma-glutamylthreonine*			0.64	0.90	1.13	0.1948	0.0448	0.8298	0.9334	0.5672	0.4005
		gamma-glutamylvaline		HMDB11172	0.97	0.99	1.14	0.7293	0.1330	0.9145	0.9334	0.3790	0.3220
Carbohydrate	Glycolysis, Gluconeogenesis, and Pyruvate Metabolism	aspartyleaspartate			0.57	1.63	1.28	0.0221	0.0082	0.1171	0.6929	0.1380	0.1858
		aspartyleucine			4.74	0.93	0.81	0.0175	0.0070	0.7618	0.9334	0.3766	0.3218
		glycyleucine	C02155	HMDB00759	3.66	1.02	0.83	0.0123	0.0054	0.7926	0.9334	0.7229	0.4396
		isoleucylglycine			3.10	0.96	0.60	0.0278	0.0098	0.8974	0.9334	0.3054	0.2858
		leucylglycine			5.94	0.90	0.79	0.0509	0.0034	0.7391	0.9334	0.6463	0.4247
	Pentose Phosphate Pathway	phenylalanylglutamate			4.60	1.10	0.78	0.0055	0.0033	0.8398	0.9334	0.6271	0.4208
		phenylalanylglycine			7.66	0.78	1.02	0.0070	0.0038	0.3910	0.9868	0.9657	0.5151
		prolylglytamate			0.98	1.23	1.35	0.75					

	galactose	C01582	HMDB00143	0.51	0.92	0.76	0.0356	0.0119	0.7789	0.9934	0.3295	0.3008
Nucleotide Sugar	UDP-glucose	C00029	HMDB00286	0.48	1.36	1.69	0.0254	0.0091	0.3339	0.9579	0.0930	0.1563
	UDP-galactose	C00052	HMDB00302	0.72	1.21	1.70	0.3458	0.0718	0.4655	0.9698	0.1457	0.1858
	UDP-glucuronate	C00167	HMDB00935	0.49	1.15	1.11	0.0125	0.0054	0.4142	0.9698	0.4164	0.3323
	guanosine 5'-diphospho-fucose			0.61	1.14	1.08	0.0114	0.0051	0.4214	0.9698	0.6925	0.4302
	Isobar: UDP-acetylglucosamine, UDP-acetylgalactosamine			0.36	0.94	0.99	0.0349	0.0118	0.7726	0.9934	0.8862	0.4844
Aminosugar Metabolism	N-acetyleneuraminate	C00270	HMDB00230	0.93	0.97	0.87	0.8334	0.1481	0.9934	0.9934	0.6218	0.4198
	erythronate*		HMDB00613	0.30	1.00	1.52	0.0335	0.0114	0.9914	0.9934	0.0273	0.1048
Energy	citrate	C00158	HMDB00094	0.55	1.23	1.15	0.1651	0.0393	0.5800	0.9934	0.8171	0.4695
	succinylcarnitine			1.00	1.00	1.00						
	succinate	C00042	HMDB00254	0.55	0.96	0.89	0.1311	0.0329	0.8412	0.9934	0.5046	0.3782
	fumarate	C00122	HMDB00134	1.46	1.17	1.33	0.6871	0.1276	0.3903	0.9698	0.1937	0.2155
	maleate	C00149	HMDB00156	0.64	1.14	1.16	0.1176	0.0298	0.3073	0.9337	0.1995	0.2185
	acetylphosphate	C00227	HMDB01494	0.80	1.00	0.98	0.3737	0.0763	0.8951	0.9934	0.9679	0.5151
Oxidative Phosphorylation	pyrophosphate (PP)	C00013	HMDB00250	1.18	1.06	0.87	0.9901	0.1716	0.9013	0.9934	0.9818	0.5161
	phosphate	C00309	HMDB01423	2.56	1.11	1.14	0.0090	0.0043	0.5940	0.9934	0.5849	0.4023
	myristate (14:0)	C06424	HMDB00806	2.45	0.91	0.78	0.0149	0.0062	0.6698	0.9934	0.2713	0.2675
	myristoleate (14:1n5)	C08322	HMDB00200	2.78	0.48	0.31	0.0028	0.0023	0.0449	0.9881	0.0019	0.0398
	pentadecanoate (15:0)	C16537	HMDB00826	2.99	1.05	1.06	0.0284	0.0099	0.7681	0.9934	0.6837	0.4302
	palmitate (16:0)	C00249	HMDB00220	4.78	0.95	0.84	0.0010	0.0011	0.7242	0.9934	0.2912	0.2795
Long Chain Fatty Acid	palmitoleate (16:1n7)	C08362	HMDB00329	9.73	0.90	0.90	0.0002	0.0004	0.6284	0.9934	0.7720	0.4350
	margarate (17:0)		HMDB02290	4.44	0.92	0.80	0.0006	0.0000	0.5480	0.9866	0.0792	0.1503
	10-heptadecenoate (17:1n7)			8.16	0.85	0.86	0.0001	0.0004	0.4874	0.9765	0.5705	0.4000
	stearate (18:0)	C01530	HMDB00827	4.00	1.04	0.85	0.0013	0.0013	0.8953	0.9934	0.4202	0.3323
	oleate (18:1n9)	C00712	HMDB00207	2.52	0.91	0.89	0.0157	0.0065	0.7109	0.9934	0.6676	0.4276
	cis-vaccenate (18:1n7)	C08367	HMDB00321	2.28	1.03	0.95	0.0292	0.0101	0.9679	0.9934	0.9551	0.5151
Polyunsaturated Fatty Acid (n3 and n6)	nonadecanoate (19:0)	C16535	HMDB00772	3.89	0.88	0.72	0.0042	0.0020	0.4589	0.9698	0.0585	0.1311
	10-nonadecenoate (19:1n9)		HMDB13622	6.83	0.77	0.67	0.0001	0.0003	0.2113	0.9698	0.0422	0.1141
	arachidate (20:0)	C06425	HMDB02121	3.70	0.88	0.79	0.0011	0.0013	0.6065	0.9934	0.3855	0.3239
	eicosanoate (20:1n9 or 11)			6.08	0.80	0.67	0.0003	0.0006	0.2003	0.9698	0.0102	0.0745
	erucate (22:1n9)	C08316	HMDB02068	3.87	0.46	0.42	0.0021	0.0018	0.0170	0.2546	0.1098	0.0745
	eicosapentaenoate (EPA; 20:5n3)	C08428	HMDB01992	7.20	1.22	1.13	0.0037	0.0027	0.5374	0.9886	0.7019	0.4324
Fatty Acid, Branched	docosapentaenoate (n5 DPA; 22:5n3)	C16513	HMDB01976	6.82	1.08	0.95	0.0006	0.0006	0.8946	0.9934	0.8842	0.4840
	docosahexaenoate (DHA; 22:6n3)	C06429	HMDB02183	5.26	1.16	1.39	0.0013	0.0013	0.1277	0.7255	0.0621	0.1338
	docosatrienoate (22:3n3)	C16534	HMDB02823	4.61	0.82	0.65	0.0008	0.0010	0.4763	0.9732	0.1215	0.1727
	linoleate (18:2n6)	C01595	HMDB00673	9.90	0.82	0.98	0.0001	0.0004	0.4582	0.9698	0.8498	0.4813
	linolenate [alpha or gamma; (18:3n3 or 6)]	C06427		8.22	0.66	0.64	0.0010	0.0011	0.2431	0.9016	0.1938	0.2155
	dihomo-linoleate (20:3n3 or n6)	C03242	HMDB02925	10.68	0.86	1.09	0.0004	0.0006	0.6004	0.9934	0.5065	0.3782
Fatty Acid, Dicarboxylate	arachidonate (20:4n6)	C00219	HMDB01043	7.99	1.04	1.08	0.0003	0.0006	0.9916	0.9934	0.5673	0.4000
	adrenate (22:4n6)	C16527	HMDB02226	3.85	1.11	0.51	0.0106	0.0048	0.6948	0.9934	0.1663	0.1967
	docosapentaenoate (n6 DPA; 22:5n6)	C16513	HMDB13123	3.71	0.92	0.84	0.0052	0.0031	0.5391	0.9866	0.2105	0.2255
	docosadienoate (22:2n6)	C16533		5.17	0.56	0.59	0.0002	0.0005	0.0483	0.4153	0.0478	0.1218
	dihomo-linoleate (20:2n6)	C16529	HMDB00360	7.05	0.79	0.75	0.0002	0.0004	0.3323	0.9579	0.2010	0.2185
	mead acid (20:3n9)		HMDB10378	5.19	1.12	0.74	0.0040	0.0029	0.6942	0.9934	0.0653	0.1341
Fatty Acid, Branched	15-methylpalmitate (isoobar with 2-methylpalmitate)			4.58	1.10	0.93	0.0065	0.0036	0.7148	0.9934	0.5692	0.4000
	17-methylstearate			4.55	1.20	0.87	0.0102	0.0047	0.4450	0.9698	0.6854	0.4302
	2-hydroxyglutarate	C02630	HMDB00606	0.24	0.94	1.15	0.0018	0.0015	0.8548	0.9934	0.3729	0.3205
	acetyl CoA	C00024	HMDB01206	0.17	1.20	0.78	0.0015	0.0015	0.3865	0.9698	0.4359	0.3399
	butyrylcarnitine	C02662	HMDB02013	1.22	0.67	0.99	0.5791	0.1088	0.1257	0.7255	0.9954	0.5201
	propionylcarnitine	C03017	HMDB00824	0.26	0.85	0.67	0.0060	0.0182	0.8365	0.9934	0.4368	0.3399
Fatty Acid Metabolism (Acyl Carnitine)	acetyl carnitine	C02571	HMDB00201	0.37	1.01	1.08	0.0047	0.0031	0.8938	0.9934	0.5844	0.4023
	hydroxybutyrylcarnitine*		HMDB13127	0.57	1.55	0.85	0.1044	0.0281	0.0959	0.6181	0.6347	0.4227
	valerylcarnitine		HMDB13128	1.00	1.00	1.00						
	hexanoylcarnitine		HMDB00705	1.00	1.00	1.00						
	octanoylcarnitine	C02838	HMDB00791	1.00	1.00	1.00						
	palmitoylcarnitine	C02990	HMDB00222	0.13	0.40	0.33	0.0027	0.0023	0.0508	0.4244	0.0241	0.1018
Carnitine Metabolism	stearoylcarnitine		HMDB00848	0.45	0.69	0.68	0.0989	0.0270	0.4294	0.9698	0.3827	0.3233
	oleoylcarnitine		HMDB00505	0.67	0.69	0.75	0.2455	0.0554	0.2846	0.9082	0.4237	0.3333
	deoxy carnitine	C01181	HMDB01161	1.30	1.15	1.08	0.8192	0.1461	0.4609	0.9698	0.7599	0.4530
	carnitine	C00518	HMDB00062	0.44	1.08	1.12	0.0050	0.0031	0.6413	0.9934	0.5283	0.3887
	3-dehydrocarnitine*	C02636	HMDB12154	0.71	1.29	0.96	0.0445	0.0141	0.5429	0.9866	0.7819	0.4561
	Neurotransmitter			0.31	0.97	0.80	0.0383	0.0125	0.8303	0.9934	0.1189	0.1714
Fatty Acid, Monohydroxy	acetylcholine											
	2-hydroxy palmitate		HMDB31057	1.61	0.92	1.18	0.2184	0.0496	0.8974	0.9934	0.6290	0.4208
	2-hydroxy stearate	C03045		1.80	0.96	1.31	0.1467	0.0359	0.9417	0.9934	0.4697	0.3599
	prostaglandin E2	C00584	HMDB01220	7.03	0.87	1.21	0.1148	0.0293	0.8551	0.9934	0.7638	0.4536
	oleic ethanolate		HMDB02088	8.56	1.14	1.33	0.0001	0.0004	0.6372	0.9934	0.2284	0.2361
	palmitoyl ethanolate	C16512	HMDB02100	22.08	0.83	2.11	0.0000	0.0001	0.3978	0.9698	0.0053	0.0696
Endocannabinoid	N-oleoyletaurine			0.89	0.97	0.61	0.4905	0.0950	0.8493	0.9934	0.0073	0.0696
	N-stearoyltaurine			1.51	0.98	0.85	0.4312	0.0846	0.9852	0.9934	0.4203	0.3233
	N-palmitoyltaurine			3.16	1.07	0.89	0.0061	0.0043	0.6485	0.9934	0.6875	0.4302
	myo-inositol	C00137	HMDB02111	0.62	1.32	1.38	0.1584	0.0382	0.1070	0.9463	0.0813	0.1502
	scyllo-inositol	C06153	HMDB00988	0.47	1.24	1.24	0.1082	0.0286	0.1927	0.9698	0.2544	0.2559
	inositol 1-phosphate (I1P)	C04006	HMDB00213	2.15	0.94	1.03	0.0037	0.0027	0.5549	0.9866	0.8193	0.4695
Inositol Metabolism	choline	C00114	HMDB00097	0.58	1.06	0.41	0.0876	0.0245	0.7552	0.9934	0.0143	0.0781
	choline phosphate	C00588	HMDB01665	0.75	0.92	1.00	0.3976	0.0796	0.8986	0.9934	0.8516	0.4813
	cytidine 5'-diphosphocholine	C03007	HMDB01413	0.42	1.30	1.49	0.0091	0.0043	0.3659	0.9934	0.0078	0.0695
	glycerophosphocholine (GPC)	C00670	HMDB0086	6.62	1.44	0.26	0.0046	0.0030	0.4646	0.9698	0.0240	0.1018
	ethanolamine	C00189	HMDB00149	0.45	1.45	0.74	0.0086	0.0042	0.0686	0.5730	0.0533	0.1286
	phosphoethanolamine	C00346	HMDB00224	0.86	1.38	1.38	0.6907	0.1277	0.4632	0.9698	0.5154	0.3829
Phospholipid Metabolism	cytidine-5'-diphosphoethanolamine	C00570	HMDB01564	0.49	1.28	1.23	0.0597	0.0181	0.2652			

		1-palmitoylplasmenylerthanolamine*		17.94	0.98	1.35	0.0001	0.0004	0.7810	0.9934	0.3359	0.3028	
Lysolipid		1-oleoylplasmenylerthanolamine*		17.21	1.30	1.31	0.0002	0.0004	0.6570	0.9934	0.2775	0.2717	
		1-palmitoylglycerophosphoethanolamine	HMDB11503	16.68	1.30	2.89	0.0003	0.0006	0.6036	0.9934	0.0157	0.0801	
		2-palmitoylglycerophosphoethanolamine*		0.23	0.27	0.49	0.0004	0.0006	0.0399	0.1218	0.0389	0.1134	
		1-stearoylglycerophosphoethanolamine	HMDB11130	12.43	1.36	2.70	0.0012	0.0013	0.3631	0.9698	0.0397	0.1134	
		1-oleoylglycerophosphoethanolamine	HMDB11506	19.28	1.13	1.93	0.0007	0.0009	0.8604	0.9934	0.0862	0.1529	
		2-oleoylglycerophosphoethanolamine*		6.56	1.01	1.42	0.0023	0.0019	0.7989	0.9934	0.4030	0.3295	
		2-monoleylglycerophosphoethanolamine*		0.50	0.60	0.91	0.0033	0.0026	0.0141	0.2360	0.5742	0.4009	
		1-arachidonoylglycerophosphoethanolamine*	HMDB11517	10.61	1.16	1.23	0.0004	0.0006	0.7712	0.9934	0.3161	0.2921	
		2-arachidonoylglycerophosphoethanolamine*		3.57	1.05	1.04	0.0031	0.0024	0.9657	0.9934	0.7524	0.4512	
		2-docosapentaenoylglycerophosphoethanolamine*		0.26	0.38	0.46	0.0033	0.0026	0.0025	0.1187	0.0332	0.1068	
		2-docosahexaenoylglycerophosphoethanolamine*		0.56	0.54	0.59	0.0190	0.0075	0.0024	0.1187	0.0420	0.1141	
		2-eicosapentaenoylglycerophosphoethanolamine*		0.49	0.69	0.66	0.0387	0.0125	0.0539	0.4377	0.0889	0.1529	
		1-docosahexaenoylglycerophosphoethanolamine*		14.13	0.97	1.62	0.0000	0.0001	0.6835	0.9934	0.0304	0.1068	
		1-palmitoylglycerophosphoinositil*		42.60	0.82	1.34	0.0000	0.0001	0.3547	0.9698	0.1054	0.1642	
		1-stearoylglycerophosphoinositil		7.87	0.84	1.55	0.0003	0.0006	0.5670	0.9934	0.0942	0.1565	
		2-stearoylglycerophosphoinositil*		7.69	0.78	1.58	0.0003	0.0006	0.3825	0.9698	0.2188	0.2294	
		1-oleoylglycerophosphoinositil*		44.94	1.16	2.06	0.0000	0.0001	0.7706	0.9934	0.0370	0.1117	
		2-oleoylglycerophosphoinositil*		24.66	1.12	1.03	0.0003	0.0006	0.9731	0.9934	0.8425	0.4809	
		1-monoleylglycerophosphoinositil*		32.90	0.99	1.30	0.0000	0.0001	0.9766	0.9934	0.3360	0.3028	
		1-arachidonoylglycerophosphoinositil*		23.57	0.97	1.48	0.0001	0.0003	0.8106	0.9934	0.1481	0.1872	
		2-arachidonoylglycerophosphoinositil*		12.07	1.62	1.45	0.0007	0.0000	0.3112	0.9337	0.2064	0.2227	
		1-stearoylglycerophosphoserine*		4.50	1.01	1.23	0.0006	0.0009	0.8782	0.9934	0.2930	0.2795	
		1-oleoylglycerophosphoserine		18.83	1.47	1.55	0.0002	0.0005	0.2698	0.9016	0.1435	0.1858	
		1-palmitoylglycerophosphoglycerol*		6.49	0.96	0.87	0.0051	0.0031	0.8962	0.9934	0.6442	0.4247	
		1-stearoylglycerophosphoglycerol		2.00	0.75	0.95	0.3351	0.0705	0.3910	0.9698	0.9107	0.4951	
		1-oleoylglycerophosphoglycerol*		6.56	0.76	0.60	0.0010	0.0011	0.4060	0.9698	0.1329	0.1831	
		2-oleoylglycerophosphoglycerol*		3.34	1.19	0.76	0.0049	0.0031	0.4824	0.9765	0.2246	0.2339	
Glycerolipid Metabolism		glycerol	C00116	HMDB00131	2.12	1.02	1.02	0.0195	0.0076	0.9107	0.9934	0.9601	0.5151
		glycerol 3-phosphate (G3P)	C00093	HMDB00126	2.80	2.17	2.13	0.2514	0.0563	0.2449	0.9016	0.6079	0.4134
Monoacylglycerol		1-palmitoylglycerol (1-monopalmitin)		HMDB31074	3.08	0.56	0.61	0.0053	0.0032	0.0388	0.3555	0.0720	0.1412
		2-palmitoylglycerol (2-monopalmitin)	HMDB11533	2.15	0.55	0.59	0.0088	0.0239	0.0254	0.3003	0.0150	0.0791	
		1-oleoylglycerol (1-monolein)	HMDB11567	2.22	0.68	0.70	0.0074	0.0038	0.1067	0.6463	0.1085	0.1642	
		1-monoleylglycerol (1-monolinolein)		8.32	0.77	0.82	0.0225	0.0083	0.0299	0.3264	0.0238	0.1010	
		2-monoleylglycerol (2-monolinolein)	HMDB11538	9.15	0.86	0.91	0.0876	0.0245	0.2775	0.9059	0.5215	0.3855	
Diacylglycerol		1,2-dipalmitoylglycerol	HMDB07098	1.62	0.80	1.14	0.5363	0.1031	0.4337	0.9698	0.8982	0.4943	
Sphingolipid Metabolism		springanine	C00636	HMDB00269	0.67	1.03	1.30	0.0390	0.0125	0.7632	0.9934	0.0548	0.1286
		palmitoyl springomyelin		1.38	1.09	1.09	0.1046	0.0281	0.4366	0.9698	0.5484	0.3960	
		stearoyl sphingomyelin	C00550	HMDB01348	1.72	2.15	2.61	0.5265	0.1016	0.0666	0.4646	0.1143	0.1689
		springosine	C00319	HMDB00252	0.63	0.63	0.62	0.0329	0.0113	0.0038	0.1218	0.0444	0.0663
Sterol		lanosterol	C01724	HMDB01251	12.57	0.99	10.35	0.0000	0.0002	0.9662	0.9934	0.0003	0.0244
		lathosterol	C01189	HMDB01170	0.60	2.61	1.56	0.3910	0.0786	0.1577	0.8295	0.2845	0.2768
		cholesterol	C00187	HMDB00067	1.74	1.11	1.07	0.0443	0.0141	0.2181	0.8698	0.4082	0.3288
		7-beta-hydroxycholesterol	HMDB00619	HMDB00619	3.54	1.54	1.75	0.0116	0.0051	0.2034	0.8698	0.2914	0.2795
		cholestanol	C12978	HMDB00908	1.41	1.23	1.06	0.2916	0.0632	0.3123	0.9337	0.6912	0.4302
Nucleotide		inosine	C00294	HMDB00196	0.84	0.94	1.06	0.5478	0.1041	0.9254	0.9934	0.9006	0.4943
		hypoxanthine	C00262	HMDB00157	0.82	1.20	1.02	0.1123	0.0292	0.1557	0.8295	0.8607	0.4839
		xanthine	C00385	HMDB00292	1.00	1.00	1.00						
		urate	C00368	HMDB00269	1.34	0.91	1.92	0.9420	0.1639	0.9093	0.9934	0.1810	0.2090
		allantoin	C02350	HMDB00462	0.20	1.03	1.40	0.0231	0.0085	0.9757	0.9934	0.0012	0.0365
		adenosine 5'-triphosphate (ATP)	C00002	HMDB00538	1.00	1.00	1.00						
		adenosine 5'-diphosphate (ADP)	C00008	HMDB01341	0.32	0.82	0.74	0.1468	0.0359	0.9670	0.9934	0.9018	0.4943
		adenosine 5'-monophosphate (AMP)	C00020	HMDB00045	0.83	1.08	1.02	0.1748	0.0410	0.4076	0.9698	0.8715	0.4844
		adenylylsuccinate	C00794	HMDB00536	0.09	0.97	1.11	0.0058	0.0033	0.8465	0.9934	0.6411	0.4247
		adenosine	C00212	HMDB00050	2.75	0.99	0.90	0.3862	0.0786	0.9532	0.9934	0.3574	0.3108
		adenine	C00147	HMDB00034	0.45	1.13	1.17	0.0080	0.0040	0.2813	0.9077	0.1888	0.2148
		diadenosine triphosphate	C06197	HMDB01155	0.24	1.06	0.96	0.0501	0.0156	0.4737	0.9732	0.6865	0.4302
		guanosine	C00387	HMDB00133	3.02	1.04	1.23	0.0080	0.0040	0.7247	0.9934	0.0910	0.1547
		guanine	C00242	HMDB00132	0.87	1.10	1.28	0.4109	0.0809	0.6410	0.9934	0.1451	0.1858
		Pyrimidine Metabolism, Orotate containing											
		orotate	C00295	HMDB00229	2.35	1.33	0.40	0.1281	0.0323	0.7077	0.9934	0.4067	0.3298
		uridine 5'-triphosphate (UTP)	C00075	HMDB00285	0.14	0.94	0.40	0.2969	0.0630	0.9189	0.9934	0.7817	0.4561
		uridine 5'-diphosphate (UDP)	C00015	HMDB00295	0.40	1.17	0.87	0.1907	0.0441	0.7095	0.9934	0.9769	0.5196
		uridine monophosphate (5' or 3')		HMDB00288	1.03	1.08	1.17	0.6984	0.1283	0.3479	0.9698	0.1589	0.1956
		uridine	C00299	HMDB00296	1.26	1.01	1.28	0.1088	0.0286	0.9614	0.9934	0.1440	0.1858
		uracil	C00106	HMDB00300	0.54	0.97	1.24	0.0205	0.0078	0.7612	0.9934	0.1619	0.1962
		pseudouridine	C02067	HMDB00762	3.20	0.99	1.55	0.0139	0.0059	0.9146	0.9934	0.1168	0.1710
		5-methyluridine (ribothymidine)	C00099	HMDB00984	0.09	0.97	1.04	0.0000	0.0001	0.5891	0.9934	0.6680	0.4276
		beta-alanine	C00095	HMDB00956	0.36	1.25	1.17	0.0751	0.0217	0.6038	0.9934	0.4987	0.3782
		Pyrimidine Metabolism, Cytidine containing											
		cytidine 5'-monophosphate (5'-CMP)	C00055	HMDB00096	0.96	1.04	1.10	0.7560	0.1366	0.6776	0.9934	0.4491	0.3476
		cytosine-2',3'-cyclic monophosphate	C02354	HMDB11691	9.39	1.00	1.00	0.3505	0.0725				
		thymidine 5'-monophosphate	C00364	HMDB01222	0.40	1.14	1.24	0.1140	0.0292	0.4271	0.9698	0.1800	0.2090
		Pyrimidine Metabolism, Thymine containing											
		thymine	C00178	HMDB00262	0.14	0.95	0.83	0.0002	0.0004	0.8993	0.9934	0.4001	0.3295
		methylphosphate			1.47	1.14	1.22	0.4563	0.0887	0.5214	0.9866	0.2379	0.2442
		Nicotinate and Nicotinamide Metabolism											
		nicotinamide	C00153	HMDB01406	1.76	0.98	1.36	0.0738	0.0215	0.9041	0.9934	0.1647	0.1964
		nicotinamide adenine dinucleotide (NAD+)	C00093	HMDB00902	0.39	1.03	0.90	0.0042	0.0029	0.8345	0.9934	0.7105	0.4350
		nicotinamide adenine dinucleotide reduced	C00004	HMDB01487	0.59	1.23	1.17	0.0128	0.0055	0.3407	0.9677	0.5718	0.4005
		1-methylnicotinamide			0.24	1.04	1.19	0.0006	0.0009	0.7903	0.9934	0.3559	0.3108
		adenosine 5'diphosphoribose	C00301	HMDB01178	4.25	1.23	1.13	0.0656	0.0194	0.1750	0.9600	0.4590	0.3552
		Riboflavin Metabolism											
		riboflavin (Vitamin B2)	C00556	HMDB00244	1.00	1.90	2.79	0.5838	0.1093	0.1550	0.8295	0.0803	0.1500
		flavin adenine dinucleotide (FAD)	C00016	HMDB01248	1.64	1.08	1.05	0.0360	0.0120	0.4329	0.9698	0.5374	0.3933
		pantothenate and CoA Metabolism											
		pantothenate	C00864	HMDB00210	0.56</td								